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(56) Documents cited
GB 2230046 A GB 2174473 A GB 1497282 A
GB 0442943 A GB 0436788 A

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(54) **Water economy device**

(57) A water economy device for installation in a waste water pipe comprises a housing (10) having an inlet (11) for admitting water from a first portion (7) of a waste water pipe (2) connected to a source of waste water, a first outlet (12) connected to a second portion (8) of the waste water pipe connected to a stack pipe (3), and a second outlet (13) for diverting waste water from the waste pipe to a hose (9) which may be connected to a utilisation device or a storage device. A valve disposed in the housing and operable by an operating lever (5) selectively opens and closes the first and second outlets so that waste water is selectively directed to the stack pipe (3) or the hose (9).

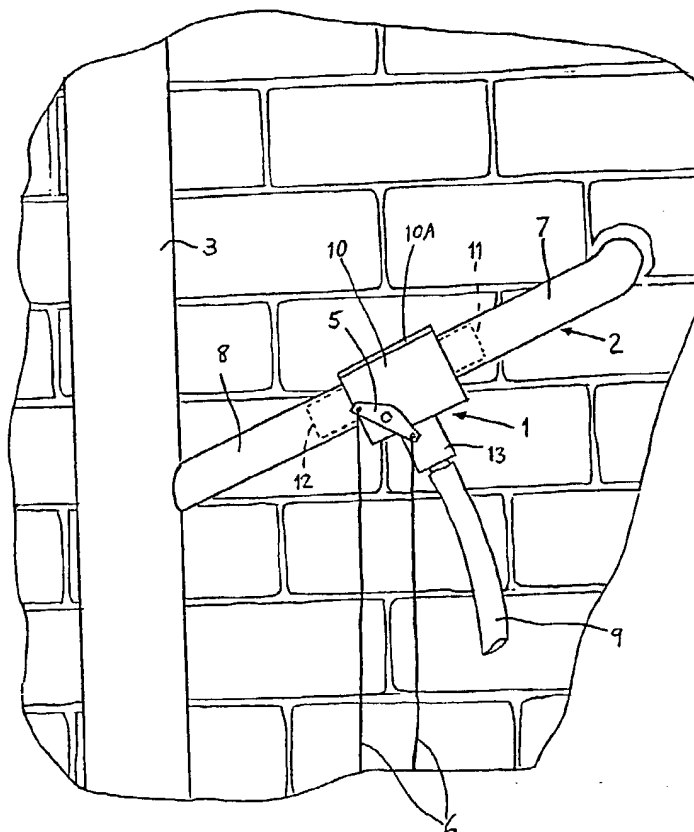


FIGURE 1

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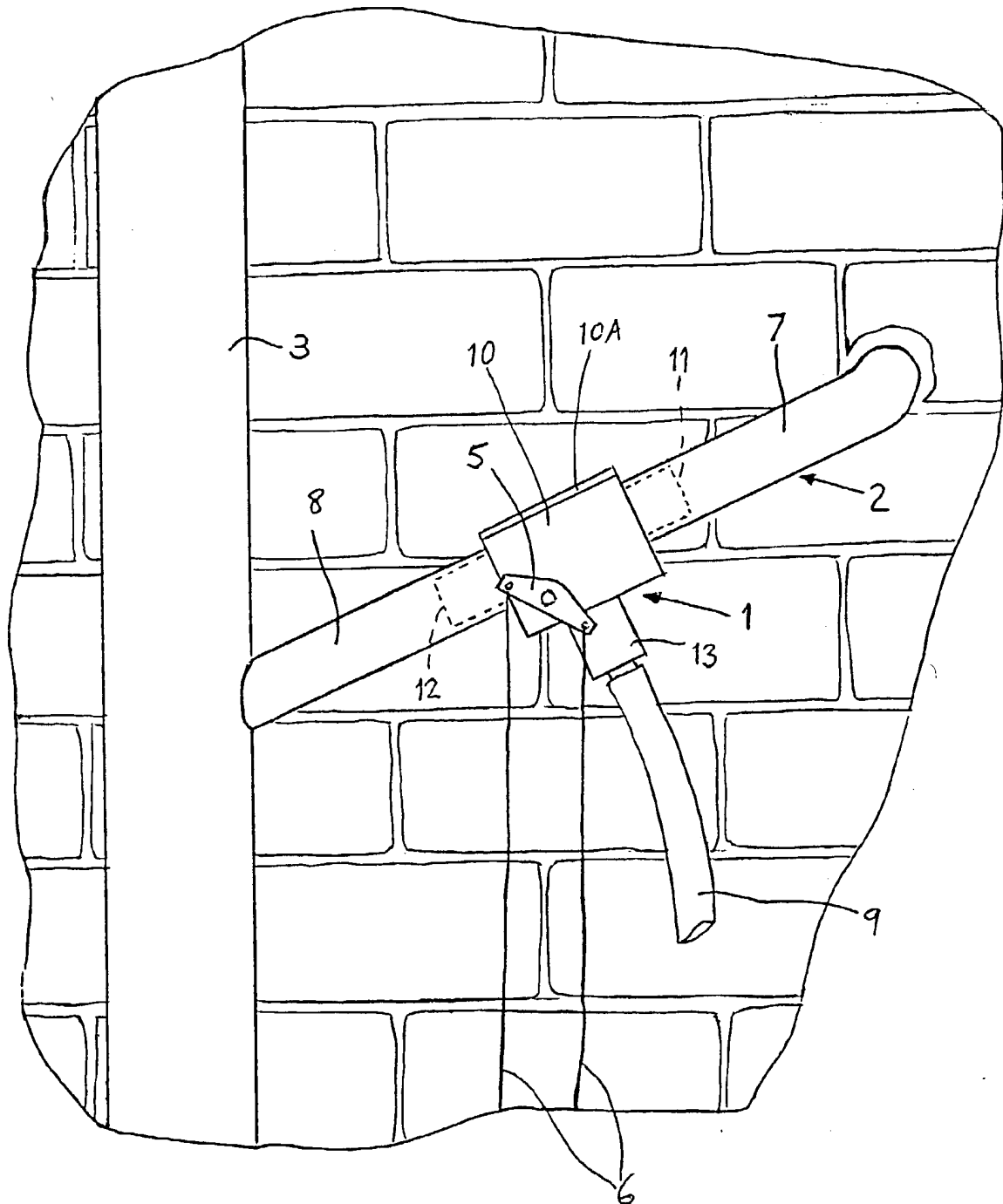
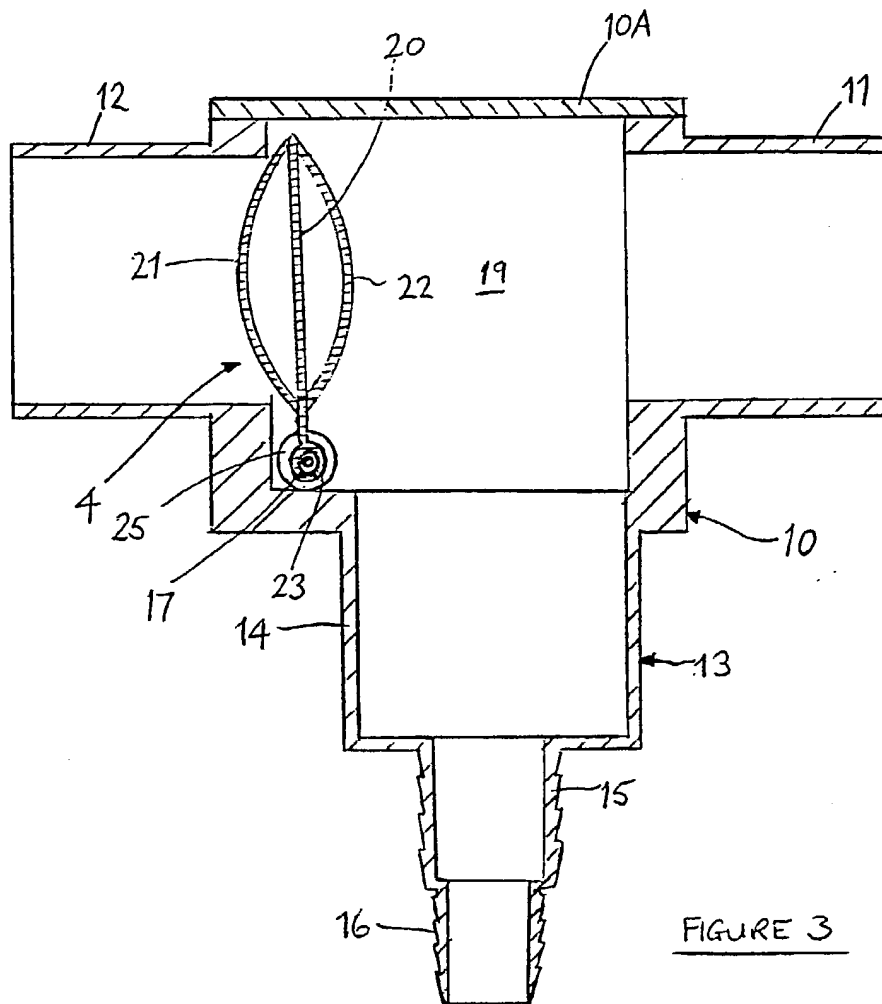
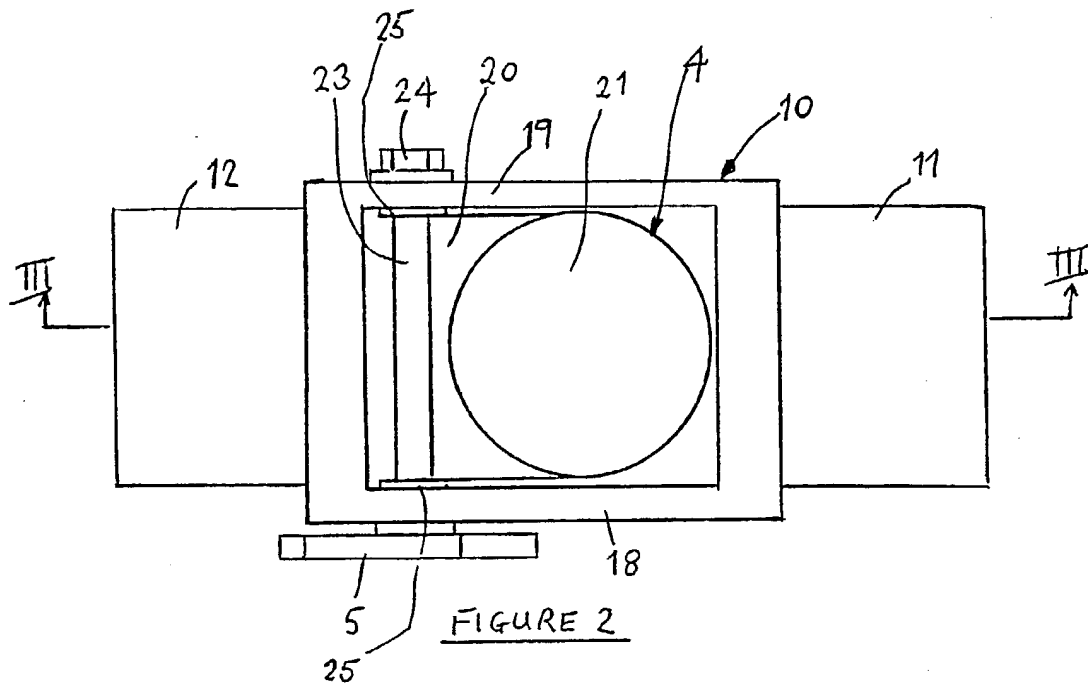


FIGURE 1

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Description of Invention

"Water Economy Device"

THIS INVENTION relates to a water economy device for enabling waste water to be readily and efficiently employed for useful purposes, such as the watering of plants or cleaning of outside structures.

A considerable amount of potentially useful non-toxic waste water is discharged from domestic and commercial premises into the drainage system. For example, water which has been used for baths, showers and non-toxic washing purposes could, with advantage, be re-used. A considerable economy in the use of valuable clean water could be realised in this way, both from necessity during periods of water shortage and at other times in order to reduce the quantity of water requiring purification.

The present invention aims to provide a device which enables such waste water to be utilised in a simple and convenient manner and, to this end, the invention provides a water economy device for installation in a waste water pipe, which device comprises a housing having an inlet for admitting water from a first portion of the waste pipe connected to a source of waste water, a first outlet for discharging water to a second portion of the waste pipe connected to a drainage system and a second outlet for diverting water from the waste pipe for re-use, the housing being provided with valve means for selectively opening and closing the first and second outlets, so that waste water is selectively directed to the first or second outlet.

The device embodying the invention thus enables waste water introduced into the first portion of the waste pipe to be selectively discharged either into the second portion of the waste pipe and thence to the drainage system or to be diverted to the second outlet from which water is conducted either to a storage location or to a point of use.

Preferably, the inlet and first outlet of the housing are provided with respective inlet and outlet spigots for insertion in the respective first and second portions of the waste pipe so as to interconnect the first and second waste pipe portions via the housing. Such a construction enables a device embodying the invention to be simply inserted into an existing waste water pipe after removal of a suitable section of the waste water pipe.

Desirably, the second outlet comprises a connecting spigot for the attachment of a flexible hose, which connecting spigot conveniently has regions of different diameter enabling the attachment of flexible hoses of different diameters to the second outlet, so that an available one of a number of standard hoses may be connected to the second outlet.

In one embodiment of the invention, the valve means comprises a pivotable valve element rotatable by control means between a first position in which it seals the first outlet and a second position in which it seals the second outlet. The control means may, for example comprise an operating lever coupled to a pivot shaft of the valve element for rotating the pivot shaft about its axis. The operating lever may be operable by remote actuating means which may be manually operable and may, for example, comprise a cord having its ends attached to respective ends of the lever so that the lever may be

pivoted in either direction about the pivot shaft by pulling on the cord.

In order that the invention may be more readily understood, an embodiment thereof will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a diagrammatic illustration showing hidden detail and illustrating a water economy device embodying the present invention installed in a domestic waste pipe;

Figure 2 is a plan view of the device of Figure 1 with a top cover of the device removed to show the interior of the device with a valve element of the device in one end position; and

Figure 3 is an axial cross-section view through the device on the line III-III of Figure 2 but with the valve element of the device in its other end position and a cover of the housing in place.

The illustrated water economy device 1 is primarily intended for domestic use and is intended to be installed in a sloping plastics waste water pipe, such as the illustrated pipe 2 carrying waste water from a bathroom of a house to a main stack pipe 3. The device 1 includes valve means 4 (see Figures 2 and 3) which are operable by a control lever 5 and a control cord 6 selectively to direct the waste water from a first or upper portion 7 of the waste pipe 2 either to a second or lower portion 8 of the waste pipe 2 or to a utilisation hose 9.

As shown more particularly in Figures 2 and 3, a housing 10 of the water economy device 1, which may conveniently be moulded from plastics material, has an

inlet spigot 11 a first outlet spigot 12 and a second outlet spigot 13. The inlet spigot 11 and the first outlet spigot 12 are dimensioned to fit into the free ends of the waste pipe 2 left by removal of an intermediate section of the waste pipe when installing the device 1. The spigots 11 and 12 may be sealed and secured to the waste pipe portions by any suitable means, such as by band clamps (not shown) encircling the waste pipe 2 around the spigots.

The second outlet spigot 13 has a first portion 14 of similar size to the inlet spigot 11 and first outlet spigot 12 and two hose-connecting portions 15 and 16 of different size to enable one of two standard diameter hoses is to be connected to the second outlet 13.

The housing 10 has a detachable cover 10A.

As shown in Figures 2 and 3, the valve means 4 of the device 1 comprises a hollow pivot shaft 17 extending through and journaled in side walls 18 and 19 of the housing 10 of the device. A flap valve is mounted for pivoting movement with the shaft 17 and comprises a plate 20 carrying on opposite faces thereof part-spherical sealing surfaces 21 and 22 for respectively sealing the first outlet 12 and the second outlet 13 in two angular end positions of the valve means. The plate 20 is formed with a sleeve 23 through which the pivot shaft 17 extends and which is attached to the shaft 17 for rotation therewith.

The control lever 5 is connected to one end of the pivot shaft 16 for rotation therewith. It is envisaged that the lever may be detachably connectable to the shaft at a selected one of a number of angular positions in order to provide for convenient and effective operation of the valve means in the particular installed position

of the device. In the illustrated embodiment this is achieved by providing the lever 5 with a hexagonal aperture receiving a nut 24 of corresponding hexagonal profile and fixed to the shaft 17. A nut 24 is fixed to each end of the shaft 17 so that the lever 5 can be mounted at either end of the shaft to suit the particular circumstances. A washer 25 is fixed to the shaft 17 between each end of the sleeve 23 and the adjacent side wall 18, 19 of the housing 10.

In use, when waste water is to be simply discharged to the drainage system, the valve is set in the position shown in Figure 2 in which the second outlet 13 is closed, thereby allowing water to flow through the upper portion 7 of the waste pipe 2, through the inlet 11 of the device, through the first outlet 12 of the device and through the lower portion 8 of the waste pipe into the main stack pipe 3.

When it is desired to divert waste water for re-use, the valve 4 is set in the position shown in Figure 3, so that water entering the device 1 is prevented from entering the lower portion 8 of the waste pipe 2 through the first outlet 12 and is instead diverted through the second outlet 12 into the hose 8 which may lead to a point of use or, if desired, to a storage device, such as a water butt.

Even if the device is installed high above the ground in a first storey waste pipe 2, the valve 4 is readily operable from the ground using the control cord 6 which would then extend down to ground level.

Whilst the illustrated embodiment of the invention is manually operated, it is envisaged that the valve 4 could be power-operated, for example by means of a suitable electric motor and switch arrangement.

CLAIMS:

1. A water economy device for installation in a waste water pipe, which device comprises a housing having an inlet for admitting water from a first portion of the waste pipe connected to a source of waste water, a first outlet for discharging water to a second portion of the waste pipe connected to a drainage system and a second outlet for diverting water from the waste pipe for re-use, the housing being provided with valve means for selectively opening and closing the first and second outlets, so that waste water is selectively directed to the first or second outlet.
2. A water economy device according to claim 1, wherein the inlet and first outlet of the housing are provided with respective inlet and outlet spigots for insertion in the respective first and second portions of the waste pipe so as to interconnect the first and second waste pipe portions via the housing.
3. A water economy device according to claim 1 or 2, wherein the second outlet of the housing comprises a connecting spigot for the attachment of a flexible hose.
4. A water economy device according to claim 3, wherein the connecting spigot has regions of different diameter enabling the attachment of flexible hoses of different diameters to the second outlet, so that an available one of a number of standard hoses may be connected to the second outlet.
5. A water economy device according to any preceding claim, wherein the valve means comprises a pivotable valve element rotatable by control means between a first position in which it seals the first outlet and a second

position in which it seals the second outlet.

6. A water economy device according to claim 5, wherein the control means comprises an operating lever coupled to a pivot shaft of the valve element for rotating the pivot shaft about its axis.

7. A water economy device according to claim 6, wherein the operating lever is remotely operable by actuating means.

8. A water economy device according to claim 7, wherein the operating lever is connected intermediate its ends to the pivot shaft and the actuating means comprises a cord having its ends attached to respective ends of the lever so that the lever may be rocked in either direction about the axis of rotation of the pivot shaft by pulling on the cord.

9. A water economy device substantially as hereinbefore described with reference to the accompanying drawings.

10. Any novel feature or combination of features described herein.

**Examiner's report to the Comptroller under
Section 17 (The Search Report)**

9027026.5

Relevant Technical fields

(i) UK Cl (Edition K) E1X

(ii) Int Cl (Edition 5) E03B

Search Examiner

D B PEPPER

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

4 FEBRUARY 1991

Documents considered relevant following a search in respect of claims

1 to 9

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2230046 A (WEEDALL)	1 to 8
X	GB 2174473 A (FISHER)	1 to 8
X	GB 1497282 (SANDEY) See page 2 lines 39 to 47	1
X	GB 0442943 (HAWKINS)	1 to 8
X	GB 0436788 (PEARCE & KING)	1 to 8

SF2(p)



Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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